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CARDIAC SYMPATHETIC INNERVATION AND LV FUNCTION ASSESSMENT TO DETERMINE RISK FOR VENTRICULAR ARRHYTHMIC EVENTS IN HEART FAILURE PATIENTS

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Authors: *Arnold F. Jacobson, Jagat Narula, Manuel Cerqueira, GE Healthcare, Princeton, NJ, USA*

Background: In ADMIRE-HF, iodine-123 meta-iodobenzylguanidine (MIBG) imaging identified heart failure (HF) patients at increased risk of arrhythmic events. This is a further analysis of the relationship between MIBG imaging results, LVEF as determined using gated SPECT myocardial perfusion imaging, and arrhythmic events including ICD activations and sudden cardiac death (SCD).

Methods: Of 961 subjects with NYHA functional class II/III HF, 414 (43%) had an ICD either at baseline (n=188) or subsequent to MIBG imaging (n=226). For these 414 subjects, average duration of exposure to an ICD during the trial was 556 days. Occurrence of all ventricular arrhythmic events, including appropriate defibrillation (DF) and SCD, was compared to MIBG heart to mediastinum ratio (H/M) and resting tetrofosmin gated SPECT LVEF. Kaplan Meier survival and Cox proportional hazards analyses were used for the assessments.

Results: Ninety-six subjects (10%) experienced arrhythmic events, including 29 SCDs, 55 ICD activations, and 38 DFs (35 delivered by ICDs), during a median follow-up of 2 years. Subjects with ICDs had significantly better 2-year survival than subjects without ICDs (91.3% vs 86.0%, p=0.006). Subjects with H/M<1.60 had a significantly higher risk of arrhythmic events than those with H/M≥1.60 (2-year event rate 12.8% vs 4.8%, p=0.003). Among subjects with ICDs, activations were more than twice as likely in subjects with H/M<1.60 (2-year event rate 17.6% vs 6.9%). For subjects with LVEF>35%, there were no DFs or SCD events among 115 subjects with H/M ≥1.60 (p=0.010 vs 6.1% 2-year event rate for 288 subjects with H/M<1.60). For subjects with LVEF≤30%, arrhythmic events were >3 times more likely with H/M<1.60 (2-year event rate 18.5% vs 5.3% for H/M≥1.60, p=0.039).

Conclusions: The MIBG H/M identified HF patients at both higher and lower risk for arrhythmic events. H/M≥1.60 is associated with a low likelihood of SCD and ICD firing, particularly for patients with higher LVEFs.